

WHAT IS CLAIMED IS:

1. A loudspeaker diaphragm comprising a base layer having a woven fabric of a polyethylene naphthalate fiber impregnated with a thermosetting resin.

2. A loudspeaker diaphragm according to claim 1, wherein the thermosetting resin is an unsaturated polyester resin or a melamine resin.

3. A loudspeaker diaphragm according to claim 1, wherein the polyethylene naphthalate fiber is an untwisted fiber.

4. A loudspeaker diaphragm according to claim 1, wherein at least part of the polyethylene naphthalate fiber is coated with a second thermosetting resin.

5. A loudspeaker diaphragm according to claim 4, wherein the thermosetting resin is an unsaturated polyester resin and the second thermosetting resin is an epoxy resin or a melamine resin.

6. A loudspeaker diaphragm according to claim 1, wherein a fiber/resin ratio in the base layer is in the range of 60/40 to 80/20.

7. A loudspeaker diaphragm according to claim 1, further comprising a thermoplastic resin layer.

8. A loudspeaker diaphragm according to claim 7, wherein the thermoplastic resin layer contains at least one selected from the group consisting of nylon, polyester, polyolefin, polystyrene, polyvinyl chloride, polyurethane, polysulfone, polyether ketone, polyether ether ketone, polyacetal, polyallylate, polyamide, polyamideimide, polycarbonate, modified polyphenylene ether, polyphenylene sulfide, polyacrylate, polymethyl methacrylate, polyether imide, polyether sulfone, polytetrafluoroethylene, a liquid crystal polymer and a thermoplastic elastomer.

9. A loudspeaker diaphragm according to claim 1, further comprising a thermoplastic elastomer layer.

10. A loudspeaker diaphragm according to claim 9, wherein the thermoplastic elastomer layer contains at least one selected from the group consisting of a polyester elastomer, a polyurethane elastomer and a polyolefin elastomer.

11. A loudspeaker diaphragm according to claim 7, wherein the thermoplastic resin layer has a finely foamed structure.

12. A loudspeaker diaphragm according to claim 11, wherein an average diameter of a cell in the finely foamed structure is 10 to 60 μm .

13. A loudspeaker diaphragm according to claim 1, wherein the base layer comprises a woven fabric of cotton or an unwoven fabric of a liquid crystal polymer.

14. A loudspeaker comprising a loudspeaker diaphragm having a base layer that has a woven fabric of a polyethylene naphthalate fiber impregnated with a thermosetting resin.

15. A method for manufacturing a loudspeaker diaphragm comprising the steps of:

impregnating a woven fabric of a polyethylene naphthalate fiber with a thermosetting resin and curing the thermosetting resin, so as to form a base layer;

adding inactive gas in a supercritical state to a molten thermoplastic resin and extruding the mixture of the thermoplastic resin and the inactive gas at prescribed temperature and pressure, so as to form a thermoplastic resin layer; and

laminating the base layer and the thermoplastic resin layer.

16. A method according to claim 15, wherein the inactive gas is selected from the group consisting of nitrogen, carbon dioxide, argon, neon, helium, oxygen and mixed gas thereof.

17. A loudspeaker diaphragm comprising a base layer as the outermost layer, a thermoplastic resin layer and a thermoplastic elastomer layer, wherein the base layer has a woven fabric of a polyethylene naphthalate fiber impregnated with a thermosetting resin.

18. A loudspeaker diaphragm according to claim 17, wherein the thermoplastic resin layer is an intermediate layer composed of a film and the thermoplastic elastomer layer is the innermost layer composed of a woven fabric or an unwoven fabric.

19. A loudspeaker diaphragm according to claim 18, wherein a thermoplastic elastomer constituting the thermoplastic elastomer layer has a melting point higher than that of a thermoplastic resin constituting the thermoplastic resin layer.

20. A loudspeaker diaphragm according to claim 3, wherein the polyethylene naphthalate fiber is a mono-filament.